

A THOUGHT LEADERSHIP ROUNDTABLE
**Data-Driven Healthcare: Building an Agile and
Future-Ready Data Foundation**



CHIME President and CEO Russell Branzell moderated the roundtable, and PureStorage representative Jon Kimerle, Global Healthcare Strategic Alliances, contributed to the discussion.

CHIME members participating were:

David Fiser

Senior Vice President and Chief
Information Officer
The MetroHealth System

Barbara Franta

Chief Applications Officer
Monarch Health

David Hamilton

Director of Technical Services,
Information Security Officer
Shepherd Center

Blaine Hebert

Vice President and Chief Information
Security Officer
Onvida Health

Michael Hsu

Executive Director of Technology
Services and Transformation
Operations
The MetroHealth System

Christian Lindmark

Vice President and Chief Technology
Officer
Stanford Healthcare

Ashish Masih

Executive Director of Business
Services and Applications
The MetroHealth System

Christine Personius

Special Projects
United Health Services

J.D. Whitlock

Chief Information Officer
Dayton Children's Hospital

SUMMARY

The College of Healthcare Information Management Executives (CHIME), in conjunction with PureStorage, convened a thought leadership roundtable to explore how members' health systems are planning to meet their growing data storage and processing needs by balancing on-premises and cloud-based systems. The CIOs, CTOs, and other leaders explained why they're currently embracing a hybrid cloud strategy, described what's holding them back from moving more data and applications offsite, and identified the key opportunities they see for expanding cloud adoption moving forward.

HEALTHCARE'S CAUTIOUS APPROACH TO THE CLOUD

After initial skepticism, today's healthcare organizations are willing to leverage the cloud. A recent [PwC business leaders survey](#) indicated 81% of organizations have adopted cloud-based services. Meanwhile, a 2023 [report from DuploCloud](#) based on a survey of 500 healthcare IT professionals suggested the adoption rate could hit 90% by 2025, with 94% of respondents that had completed a cloud migration recommending it to their peers.

That said, the industry remains hesitant to fully transition to the cloud. [Past research from CHIME](#) has shown that about 74% of organizations using cloud-based services prefer the hybrid cloud adoption model. This strategy typically keeps sensitive patient and financial information as well as mission-critical applications on-premises so internal IT teams can keep their eyes on them.

More broadly, a 2022 [qualitative study conducted by The University of Edinburgh](#) noted numerous barriers to widespread cloud adoption in healthcare. These include the financial and operational costs of migrating legacy applications; limited internal skills and resources to manage cloud-based services; the challenge of change management in a risk-averse industry, and the difficulty of articulating "immediately visible benefits for end users" who would be asked to access data and applications differently.

A second [PwC healthcare trends report](#) offered a telling summary of the cloud landscape in healthcare. While "cloud engineering drives innovation at scale and can migrate data and workloads, modernize infrastructure and applications, and accelerate idea realization through cutting-edge cloud-native software development," the report said, about half of organizations that adopted the cloud "have yet to realize all the value from their investment."

10 REASONS HEALTHCARE ISN'T ALL-IN ON THE CLOUD

Among roundtable participants, and in alignment with the past CHIME survey, organizations are generally sticking with the hybrid cloud approach. No organization had more than 40% of its applications transitioned to the cloud, and what's on the cloud tends to be Software as a Service (SaaS) applications that aren't hosted on-premises in the first place.

"Our strategy is that core clinical applications are on-premises and will remain that way," said J.D. Whitlock, Chief Information Officer, Dayton Children's Hospital. "And then everything else is hybrid."

Roundtable participants cited 10 reasons why their organizations have been reluctant to fully transition to the cloud.

- 1. Cloud migration has a hidden cost.** "If you really want me to move, you've got to find a way to make it 20% cheaper than I've ever paid to be on premises," said Christian Lindmark, Vice President and Chief Technology Officer, Stanford Healthcare. Why? The IT resources needed to support a move to the cloud are taken away from work that directly supports patient care.
- 2. Data silos make migration difficult.** A key promise of the cloud is the ability to aggregate and normalize previously disparate data sources. But finding where data is stored – and, often, in a large health system, stored in multiple copies – is a Herculean effort, noted Blaine Hebert, Vice President and Chief Information Security Officer, Onvida Health, in Yuma, Arizona. Getting applications integrated is a tall order as well.
- 3. Costs can go up unexpectedly.** Yes, organizations benefit from no longer acquiring and maintaining on-premises infrastructure. However, there's no guarantee that vendors with revenue targets to hit won't raise their prices with little notice. Nor is there a guarantee that a handful of additional features will justify the price increase.
- 4. Geography can make connections difficult.** Yuma is in the Sonoran Desert, a few miles from Arizona's border with Mexico. The location can make high-speed Internet connections challenging, Hebert said. It's also far from cloud service provider's colocation sites. Both factors dampen enthusiasm for cloud migration.
- 5. Clinicians need access to historical data.** Many organizations assumed older imaging studies had little value to end users, could be archived on the cloud, and didn't need to be factored into business continuity plans. As it turns out, historical data is valuable for surgeons trying to decide if a procedure should be done and needs to be available during an outage, noted Barbara Franta, Chief Applications Officer, Monarch Health.
- 6. Organizations have a hard time giving up control.** Internal collaboration is common with on-premises deployments, especially when it comes to major changes, but Franta noted it doesn't always happen with SaaS platforms. There's also peace of mind from owning physical equipment. "Your team can take care of issues immediately. When you're going through the cloud with many vendors, you don't have control at all," said David Fiser, Senior Vice President and CIO, The MetroHealth System.

- Vendors may not understand healthcare's complexities.** Vendors that are keen to help organizations move electronic health record systems to the cloud don't always understand how many additional applications are deeply integrated with the EHR and would also need to be migrated, Lindmark noted.
- 24/7 support isn't always what it seems.** Vendors with staff around the globe can offer 24/7 support, but it can easily mean an issue jumps from one person to another based on when a phone call is made. "When you have to follow the sun for four days, and you still don't get the right answer, it's enough to want to say, 'We're done,'" said David Hamilton, Director of Technical Services, Information Security Officer, Shepherd Center.
- Data may not be fully protected.** Hamilton and his team have strengthened business associate agreements to provisions that further enhance the organization's position regarding ownership of its data in the event a contract does not renew. Similar provisions may be necessary to ensure backups of protected health information (PHI) remain in the United States, noted Christine Personius, Special Projects, United Health Services.
- Vendors are vulnerable to cyberattacks.** According to the [American Hospital Association](#), 58% of individuals affected by data breaches in 2023 were due to attacks on business associates. While vendors have strong security protections in place, "You just have to accept the risk that something bad might happen," Whitlock said.

KEY CLOUD OPPORTUNITIES THAT LIE AHEAD

Healthcare has clear reservations about moving to the cloud. But avoiding the cloud isn't a sound business strategy, either. The aforementioned [PwC business leaders survey](#) found organizations leading the way in cloud adoption are twice as likely as their peers to improve profitability and productivity, create innovative products and services, and identify new revenue streams.

Of course, the key is identifying the right reasons to invest in the cloud. Roundtable participants highlighted three opportunities for health systems to make the most of cloud-based services – with the caveat that it's important for leaders to do their homework before signing a contract.

Scalability

Several years ago, an [IDC-Seagate analysis](#) projected the compound annual growth rate for healthcare data would reach 36% by 2025. Healthcare's projected CAGR outpaced all other industries by 9%. Back in 2019, the [World Economic Forum](#) estimated hospitals produced an average of petabytes of data each year – a figure that has certainly risen since then.

There are clear benefits to being able to add data storage resources on demand. Building robust analytics models requires large data sets. As imaging studies get more detailed, file sizes increase. As genomic sequencing gets less expensive and more accurate, it's entirely possible patients will have their entire genome as part of their medical record.

When it comes to cloud storage, roundtable participants had two important financial considerations. For Stanford Healthcare's Lindmark, "The question is, will the cost of storage continue to decline at the same pace that the rate of storage growth is going to occur?" For MetroHealth's Fiser, there's also the question of whether the total cost of migrating storage to the cloud – the contract plus the work the health system needs to do – exceeds the cost of on-premises maintenance.

Ongoing cost management

Bills from cloud service providers aren't entirely predictable. As noted, rates can go up. Additionally, organizations risk exceeding their resource allotments if they haven't factored elasticity into their contracts. This is all too common with medical research that uses a lot of computing power. It can also happen if new applications go live and organizations haven't revisited their terms and conditions.

Even so, the operating model of the cloud can offer an advantage when it comes to cost management, noted Jon Kimerle, Global Healthcare Strategic Alliances, Pure Storage. "You can align your acquisition model with the business outcome. If it's a short-term and unpredictable workload, you can use OpEx and consume storage as a service either on premises or in the public cloud. If it's a stable workload that you can plan for, CapEx and owning the solution may make the most sense," he said. This contrasts with, say, acquiring on-premises CapEx infrastructure to manage a six-month research study.

Again, Lindmark offered a caution: Capital expenses can be delayed in a pinch, while cutting operating expenses often means cutting people. Ashish Masih, Executive Director of Business Services and Applications, MetroHealth, looked at it another way. "Let's say I have a fraction of a full-time equivalent supporting an on-premises database," he said. "Moving that application to the cloud doesn't repurpose the FTE. The overall cost is still there."

Technical debt

Moving data storage and application infrastructure offsite can relieve healthcare of its sprawling onsite technical debt. "As health systems, we've been doing the bare minimum required at the time to manage our technology stack and then continued to build on top of it," Monarch Health's Franta said. "As we've been kicking the can down the road, we've just dug a deeper and deeper hole."

Getting this right requires close collaboration with the executive team, Franta continued. Misallocation of resources is a big part of what forces IT teams to do the bare minimum in the first place. "Our business partners have to go back to the table with us to help get that funding and make sure it's allocated correctly and stays there."

It's common for health system leaders to move to the cloud simply because they want to get out of the data center business and demonstrate a commitment to innovation. Even so, Onvida Health's Hebert said organizations need to do a cost-benefit analysis – especially considering the likelihood that [data storage may make more sense onsite](#) after all. "What's the ROI for putting your stuff in cloud, and what are the resources you would need to do it on-premises?"

AVOID GETTING CAUGHT OFF GUARD BY THE CLOUD

As health system leaders weigh the merits and drawbacks of the cloud, there's one more factor to consider.

“Right now, we're mostly hybrid cloud, with more on-premises — but a lot of that is shifting because a lot of our partners only offer SaaS-based solutions. We don't have a choice sometimes,” said Michael Hsu, Executive Director of Technology Services and Transformation Operations, MetroHealth. Similarly, Whitlock pointed out that one Dayton Children's partner will support on-premises installs but only offers new features to customers running its application in the cloud.

If health systems feel they have no choice, then they need to be prepared. Roundtable participants offered four suggestions to help leaders look to the future. Two emphasize work to be done internally, and two focus on what to ask from third-party partners.

Get smart about data governance. Stanford Healthcare's Lindmark said data governance strategy takes on added importance as organizations pursue not just the cloud but also artificial intelligence (AI). Research has shown [clinical data decays in value](#) over time, United Health Services' Personius pointed out, “but most organizations don't track or purge their data.” Onvida Health's Hebert agreed: “When we're in silos, we have everything scattered. There's duplication, replication, triplication, whatever you want to call it – and nobody has the resources to clean it up.”

Remember, the cloud isn't monolithic. PureStorage's Kimerle reminded organizations that cloud infrastructure comes in many flavors. There are options available on a continuum between fully on-premises and fully in the cloud. Even a hybrid cloud comes with choices. “It's really about creating a hybrid cloud platform that allows you to dynamically move workloads where they make the most sense without a financial penalty,” he said.

Push for standards across leading cloud vendors. Dynamically moving workloads isn't without obstacles, though. Organizations need to be able to move from one cloud service provider (CSP) to another without “a study of builds and handouts,” as Shepherd Center's Hamilton put it. “We need to come up with standards across the major cloud providers what would allow us to do some orchestration back and forth – because in the end, it's just somebody else's computer,” he said.

Push vendors to understand the business of healthcare. Roundtable participants also encouraged health systems leaders to educate CSPs about the industry's unique business needs. These include but aren't limited to the need for onsite backups, the large-scale implications of seemingly minor updates, the importance of dedicated support, the interconnectedness of clinical applications, and the imperative for strong cybersecurity. As Personius put it: “We're dealing with people's lives.”

THE LONG AND SHORT OF A CLOUDY FUTURE

Health system leaders generally recognize the benefits of cloud infrastructure, especially given the resources necessary to maintain on-premises legacy systems. Few organizations are ready to truly commit to the cloud, though. Their hesitation is understandable: It's difficult to anticipate the pressure an initial cloud migration can put on internal resources, while healthcare's ongoing need for 24/7 support has proven difficult even for global service providers to meet.

Further, shifting infrastructure and data to the cloud does not also shift responsibility. “You’re still held accountable and responsible for cybersecurity,” Branzell reminded. “When there is a security incident and systems and data are impacted, it will be your reputation and image that are at risk.”

At the same time, health system leaders generally accept that the writing’s on the wall. Their partners are increasingly pushing SaaS offerings, while storage demands are leaving internal data centers bursting at the seams. Organizations can respond by taking pragmatic steps to help make the transition to the cloud, whether by shoring up data governance or determining how the cloud can reduce technical debt. There’s also a benefit — both for individual organizations and the industry as a whole — to helping vendors understand what health systems need to get the most from cloud services.